Eating and the brain

food for thought

Møller, Per

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EVENT ABSTRACT

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Eating and the brain: Food for thought

Per Møller[1]

[1] University of Copenhagen, Faculty of Science, Denmark

Eating and drinking are, together with breathing and sexual activity, the most important human behaviours. Even though the fundamental reason why we (need to) eat is to supply energy and nutrients to the body and brain, macro- and micro-nutrients are not sensed directly. What we sense directly is the “taste of foods” or more precisely their flavours.

Four different senses, taste, smell, touch and chemesthesis (perception of hot spices, pain) contribute to flavour, with vision and audition occasionally modulating what we perceive when we eat. The sense of smell increases enormously the dimensionality of the perceptual space defined by the 5 basic tastes (sweet, salty, bitter, sour and umami) and chemesthesis, since the human olfactory system can distinguish an almost infinite number of (food) aromas/smells. Our brains solve a major multisensory binding problem when we experience the “taste” of our food and drink.

We don’t all like the same foods. Why is that? People in Korea like different foods than people in Greece etc. Only very few food preferences are genetically determined. Most notably, all humans seem to be born liking sweet and fat tastes. This is a ‘clever trick’ of nature, or put differently, humans would be in great trouble if this wasn’t the case, considering the taste of the food we all lived from the first half year of our life. There is one taste humans are born with a strong dislike for: bitter. As with sweet and fatty tastes, this makes much developmental sense, since many poisonous plants in nature taste bitter. We need to ‘learn’ to appreciate bitter tastes. This explains why you didn’t enjoy the first beer you drank or why many young people drink their coffee with sugar and cream.

If the overwhelming majority of what we like or accept to eat is not genetically determined, it must be learned. This also explains the very many different culinary traditions in the world and why the human species has been very successful in spreading all over the world. We can live anywhere and eat what nature has to offer wherever we are. This is unlike the Panda bear, who can only live from bamboo! In humans, a range of conditional learning mechanisms shape which foods we like and accept.

Since eating is crucial for survival, very strong motivational mechanisms control intake. Food reward (liking, wanting, satisfaction) relies on similar mechanisms as some types of (unwanted) addictions. It has been argued that reward obtained from eating is to a large extent responsible for the obesity epidemic. It might appear intuitively obvious that people eat more of a food if it tastes well. Or it might be the other way around, that if foods are bland, we don’t get enough satisfaction from eating and as a result eat larger portions. Some recent studies of food reward suggest that food satisfaction might be the solution, not the problem, in curbing overeating. That is, that ‘food quality’ can replace ‘food quantity’.

Eating behaviour raises many basic and applied neuroscientific problems in perception, cognition and emotion. In this way, it can act as a vehicle for better understanding of the workings of the brain.

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